APPENDIX B

SUMMARY OF WASTE CHARACTERISTICS AND CHEMICAL ANALYSES

Table B-1
Summary of Waste Characteristics and Chemical Analyses - Sumps (S and N)
ATK Thiokol Propulsion, Bacchus Works, Magna, Utah

Solid Waste Management Unit (SWMU)	Material Handled and Waste Types	Influent Streams	Ponded Water	Sediments/Soils	Remedial ICMs to date and Work Plans Submitted
Sump No. S-1 (Includes ditch to the north) Sample Machining Building 2151	Propellants, coolant waters, mop waters	NG – 55 ppm HMX – 4500 ppm Metals (T) – BDL VOCs – No analyses	NG – 298 ppm DI-NG – 18 ppm HMX – 1 ppm Lead – 0.17 ppm	NG – 213 mg/kg DI-NG – 44 mg/kg HMX – BDL EP Toxic* Metals – BDL	9/98, ClO_4 ICM Stage I ATK/Radian/EarthFax
Sump No. S-2 Machining Complex Buildings 2114, 2115, 2116 And Wastewaters from Bacchus West Plant and Building 49A	Propellants (all programs), coolant water, rags, TCE	NG – 433/1068 ppm HMX – 2/7 ppm DI-NG – 20 ppm Freon – 3.15 ppm 1,1,1-TCA – 4 ppm Pb (T) – 64.7 ppm Al – 285 ppm MC – 61 ppb	NG – 488 ppm DI-NG – 5 ppm HMX – 2 ppm Pb (T) – 0.3 ppm NH4 – 500 ppm	NG – 363 mg/kg DI-NG – 234 mg/kg HMX – 4640 mg/kg Pb (T) – 0.3 mg/kg EP Toxic* Lead – 1.3 ppm	10/98, ClO_4 ICM Stage I ATK/Radian/EarthFax
Sump No. S-3 Casting Building No. 1, 2155, and Building 49-A	Propellants (A-3), propellant chips, TA, rags, freon	Total Lead – 234 mg/l Dissolved Lead – 1.5 mg/l EP Toxic* lead – 2.1 ppm NG – 1700 ppm DI-NG – 3.5 ppm HMX – 1.73 ppm	Ponded water not sampled	EP Toxic* Arsenic – 0.02 ppm NG, DI-NG, HMX (BDL)	10/98, ClO_4 ICM Stage I ATK/Radian/EarthFax
Sump No. S-4 Grain Saw Building 2164	Propellants (all programs), AC/TA (50-50), rags	NG – 16/50.0 ppm HMX – 0.9/4.4 ppm Total Lead – 3.2 mg/l Cadmium – 0.003 mg/l Chromium – 0.35 mg/l Mercury – 0.006 mg/l Silver – 0.005 mg/l Arsenic – 0.3 mg/l Barium – 0.76 mg/l	NG- 125 ppm HMX – 5330 ppm	NG – 214 mg/kg HMX – 2700 mg/kg EP Toxic* Arsenic – 0.44 ppm	7/00, ClO_4 ICM Stage II ATK/Radian/EarthFax
Sump No. S-5 Casting Building No. 2 2101	Propellants (all programs), propellant chips, TCE, rags	Total Lead – 148/140 mg/l Dissolved Lead – 1.0 mg/l EP Toxic* Lead – 1.2 mg/l HMX – 1.0/3.4 ppm	No info.	HMX – 195 mg/kg EP Toxic* Arsenic – 0.05 ppm	8/00, ClO_4 ICM Stage III ATK/Radian/EarthFax
Sump No. S-6 Mix Building No. 1 2362	Propellants (all programs), AC/TA (50-50), rags	HMX – 2.9 ppm Dissolved Lead – 1.2 mg/l EP Toxic* Lead – 0.64 mg/l Total Lead – 259 mg/l	No info.	EP Toxic* Lead – 155.ppm HMX – 3 mg/kg	11/98, ClO_4 ICM Stage I, ATK/Radian/EarthFax

Table B-1 (Cont.)

Solid Waste Management Unit (SWMU)	Material Handled and Waste Types	Influent Streams	Ponded Water	Sediments/Soils	Remedial ICMs to date and Work Plans Submitted
Sump No. S-7A, 7B Mix Bowl Cleaning Building 2366	Propellants (all programs), AC/TA (50-50), rags	NG – 1.5 ppm DI-NG – 6.9 ppm HMX – 1.6 ppm Freon – 48 ppb Total Lead – 15 ppm EP Toxic* Lead – 0.17/9.26 ppm	No info.	No info.	11/98, ClO_4 ICM Stage I, Sumps 7a & 7b, ATK/Radian/EarthFax
Sump No. S-8 Mix Building No. 2 2389	Propellants (all programs), AC/TA (50-50), Freon, SS, rags	DI-NG – 21.7 ppm HMX – 5.0/5.3 ppm Freon – 1.2 ug/l Total Lead – 106/90 ppm EP Toxic* Lead – 106/90 ppm Total Aluminum – 175 ppm	No info.	(1985) NG, HMX, EP Toxic* Metals not detected (1987) Presence of explosives and lead-No concentrations given	11/98, ClO_4 ICM Stage I, ATK/Radian/EarthFax 2/99, outlying holes drilled and sampled, ATK /EarthFax
Sump No. S-9A, 9B NDT Photo Labs Buildings 2186 and 2187	Photo chemicals	Silver – 0.023/0.8 mg/l	No info.	EP Toxic* Metals: Silver – 2000/8500 ppm Lead - 20/60 ppm Arsenic – 7/24 ppm Chromium – 20/110 ppm Cadmium - <1/18 ppm Barium – 20/80 ppm	
Sump No. S-10 Gam Saw Temporary Building (no number)	Propellants (similar to S-2)	NG – 319.5 ppm DI-NG – 7 ppm HMX – 2.95 ppm	No info.	HMX – 1180 mg/kg DI-NP – 9 mg/kg	Spring 01, ClO_4 ICM Stage III ATK/Radian/EarthFax
Sump No. S-11 50 Gallon Mix Building 2214	Propellants (all programs), AC/TC (50-50), Freon, rags	NG – BDL – 6 ppm DI-NG – BDL – 21.7 ppm HMX – 5.0/5.3 ppm Freon – 1.2 ug/l (T) Lead – 106 mg/l (D) Lead – 0.34 mg/l EP Toxic* Lead – 0.2 mg/l	No info.	DI-NG – 2 mg/kg Toxic Metals – (BDL)	Spring 01, ClO_4 ICM Stage II ATK/Radian/EarthFax
Sump No. S-12 Propellant Mix Building 2216	Propellants (all programs), AC/TC (50-50), Freon, rags	HMX – 307.5/3.0 ppm Freon – 69 ug/l (T) Lead – 0.18/200 mg/l (D) Lead – 8.5 mg/l EP Toxic* Lead – 11 mg/l NH_3 – 94 mg/l	No info.	No info.	Spring 01, ClO_4 ICM Stage III ATK/Radian/EarthFax

Table B-1 (Cont.)

Solid Waste Management Unit (SWMU)	Material Handled and Waste Types	Influent Streams	Ponded Water	Sediments/Soils	Remedial ICMs to date and Work Plans Submitted
Sump No. S-13 NG Neutralization Buildings 2274 and 2281	2-NDPA, 2-NDPA and water	No info.	No info.	NG – 154 mg/kg DI-NG – 32 mg/kg EP Toxic* Arsenic – 0.04 ppm EP Toxic* Lead – 1.8 ppm	
Sump No. S-14 Solvent Preparation Building No. 1 2142	NG, dilute NG/TA, rags	NG – 1574 ppm DI-NG – 995 ppm Freon – 7.6 ug/l (T) Lead – 0.43 ppm	No info.	NG – 12,400 mg/kg DI-NG – 360 mg/kg EP Toxic* Metals: Arsenic – 0.006 ppm Cadmium – 0.04 ppm Lead – 1.9 ppm	
Sump No. S-15 Solvent Preparation Building No. 2 2437	NG, dilute NG/TA, rags	NG – 1280 ppm DI-NG – 803 ppm EP Toxic* Lead – 0.62 ppm Chromium – 0.06 ppm	No info.	NG – 1770 mg/kg DI-NG – 255 mg/kg Metals (T) – BDL	
Sump No. S-16 Biazzi Nitrator Building 2272	NG,NG/water	NG – 34 ppm DI-NG – 8 ppm HMX – 1.65 ppm (T) Chromium – 0.01 ppm (T) Lead – 0.07 ppm	No info.	EP Toxic* Lead – 4 ppm NG – 1 mg/kg	
Sump No. S-17 HMX Dry Building 2289	RDX propellant, AC/TA, rags	No samples taken	No samples taken	No samples taken	Spring 01, ClO_4 ICM Stage II ATK/Radian/EarthFax
Sump No. S-19 Sub. Scale Buildings 2205 and 2328	Propellant (all programs), AC/TA, Freon, rags	No samples taken	No samples taken	No samples taken	Spring 01, ClO_4 ICM Stage III ATK/Radian/EarthFax
Sump No. S-20 5 Gallon Mix Building 2212	Propellant (all programs), AC/TA, Freon, rags	No samples taken	No samples taken	No samples taken	Spring 01, ClO_4 ICM Stage III ATK/Radian/EarthFax
Sump No. S-21 Complex C Building 8121	Septic and lab sink discharges	No sampling data	No sampling data	No sampling data	Spring 01, ClO_4 ICM Stage III ATK/Radian/EarthFax
Sump No. S-22 Casting Building No. 2 2101 and Building 2104	Propellants (all programs)	No sampling data	No sampling data	No sampling data	

Table B-1 (Cont.)

Solid Waste Management Unit (SWMU)	Material Handled and Waste Types	Influent Streams	Ponded Water	Sediments/Soils	Remedial ICMs to date and Work Plans Submitted
Sump No. S-23 Binder Pre-Mix Building 2230	Propellant ingredients, Freon, TA, rags	No info.	No info.	Sampled for explosives and metals No contamination detected	
Sump No. S-24 Storage Building 9329	NG raw materials, condensate, floor wash waters	No samples taken	No samples taken	No samples taken	
Sump No. S-25 Building 9112	Sulfuric and nitric acids Acid mud (neutralized with Na_2CO_3)	No samples taken	No samples taken	No samples taken	
Sump No. S-26 Beneath Building 2300	NG production, wash waters	No analytical data	No analytical data	No analytical data	
Sump No. S-27 Beneath Building 2300	Solvent preparation	No analytical data	No analytical data	No analytical data	
Sump No. S-28 Building 8136 Building 2369	Propellants lab	No analytical data	No analytical data	No analytical data	
Sump No. S-29 Building 8135 and 8137	Photoprocessing and chemical lab	No analytical data	No analytical data	No analytical data	
Sump No. S-30 Building 8130	No data	No analytical data	No analytical data	No analytical data	
Sump No. S-31 Buildings 2251 and 2254	Acidic wastewaters	No analytical data	No analytical data	No analytical data	
Sump No. S-32 Base Grain Transfer Building 2110	Propellants	No analytical data	No analytical data	No analytical data	Spring 01, ClO_4 ICM Stage III ATK/Radian/EarthFax

Table B-1 (Cont.)

Solid Waste Management Unit (SWMU)	Material Handled and Waste Types	Influent Streams	Ponded Water	Sediments/Soils	Remedial ICMs to date and Work Plans Submitted
Sump No. S-33A, 33B Hazards Analyses Lab Building 8123	Propellants and explosives	No samples taken	No samples taken	No samples taken	
Sump No. S-34A, 34B Hydrotesting Building 2452	No data	1,1,1 TCA 4 g/l Barium – 0.08 mg/l	No info.	No info.	
Sump No. S-35 Buildings 8142 and 8151	Propellant test burning	No samples taken	No samples taken	No samples taken	
Sump No. S-36 Flare Stack Building 2440	No data	No samples taken	No samples taken	No samples taken	
Sump No. S-37 Motor Cleaning Building 2195	No data	No samples taken	No samples taken	No samples taken	Spring 01, ClO_4 ICM Stage III ATK/Radian/EarthFax
Sump No. S-38 Maintenance Department Paint Shop Building 8126	Floor wash and brush cleaning waters	Toluene – 0.05/6 mg/l Xylene – 0.018/0.37 mg/l	No info.	No info.	
Sump No. S-39 Old NG Laboratory	No data	No samples taken	No samples taken	No samples taken	
Sump No. N-1 Building 50-A	Wash waters	No info.	No info.	Arsenic – 0.02 mg/kg	
Sump No. N-2 Binder Pre-Mix Building 45A	Propellant Ingredients, Freon, TA, rags	(T) Lead – 39 mg/l	No info.	Arsenic – 0.02 mg/kg	
Sump No. N-4 HMX Grind Building CD2C	HMX, HMX/water	HMX – 112.3 mg/l (T) Lead – 2.0 mg/l (D) Lead – 2.5 mg/l EP Toxic* Lead – 2.2 mg/l	No info.	Arsenic – 0.005 mg/kg HMX – 4506 mg/kg DI-NG – 165 mg/kg	Fall 00, ClO_4 ICM Stage II ATK/Radian/EarthFax
Sump No. N-5 HMX Dry Building CD3A	HMX, HMX/water, ALOH	HMX – 5.1/105.2 ppm Isopropyl alcohol – 26 percent (T) Lead – 0.73/0.15 ppm Chromium – 0.2 ppm Mercury – 0.7 ppm Oil and Grease – 3300 ppm	No info.	Arsenic – 0.01 mg/kg HMX – 7000 mg/kg NG – 200 ppm DI-NG – 174 ppm	5/00, ClO_4 ICM Stage II ATK/Radian/EarthFax

Table B-1 (Cont.)

Solid Waste Management Unit (SWMU)	Material Handled and Waste Types	Influent Streams	Ponded Water	Sediments/Soils	Remedial ICMs to date and Work Plans Submitted
Sump No. N-6 Buildings CD2A	HMX, HMX/water	HMX – 112 ppm (T) Lead – 120 mg/l (D) Lead – 0.18 mg/l EP Toxic* Lead – 0.18 mg/l	No info.	Arsenic – 0.01 mg/kg HMX – 4950 mg/kg NG – 77 mg/kg DI-NG – 317 mg/kg	Fall 00, ClO_4 ICM Stage II ATK/Radian/EarthFax
Sump No. N-7 Mold Assembly Building 4A	Propellants (all programs), Freon, TA/AC, rags	(T) Lead – 4.3/217 ppm HMX – 5.5 ppm Freon – BDL	No info.	NG- 30.3 mg/kg HMX – 275 mg/kg EP Toxic* Lead – 79 ppm EP Toxic* Cadmium – 0.31 ppm	4/00, ClO_4 ICM Stage III ATK/Radian/EarthFax
Sump No. N-8 Earthen sump located north east of NIROP Binder Pre-Mix/Storage (sealed, not opened) Bldg. 10B (2349)	Freon 113 used in Mini-Mine manufacturing during mid to late 1960s was released to ground. Floor Wash (containing no contaminants).	No Sample taken	No info.	8/14/85 Sediment sample for EP Tox, As 0.05 ppm all other metals < EP Tox level	ICM Soil Gas Survey approved by UDSHW 11/14/97, confirmation letter dated 2/4/99.
Sump No. N-10 Lab QA Building 27A	Propellants (all programs), $Al_2,0_3$, water, miscellaneous chemicals	Arsenic – BDL Chromium – BDL	No info.	NG – 5 mg/kg HMX – 1000 mg/kg EP Toxic* Arsenic – 0.008 ppm	Fall 00, ClO_4 ICM Stage III ATK/Radian/EarthFax

Legend

*Extraction Procedure Toxicity Characteristic analysis used on samples prior to September 25, 1990 to indicate toxicity; replaced with the Toxicity Characteristic Leaching Procedure (TCLP), effective September 25 1990

Explosives
- NG - Nitroglycerin
- DI-NG - di-Nitroglycerin
- AP - Ammonium perchlorate
- HMX - Cyclotetramethylene tetranitramine
- NC - Nitrocellulose
- BTTN - Butanetriol trinitrate
- RDX - Cyclotrimethylene trinitramine

Volatile Organic Compounds (VOC's)
- 1,1,1 TCA - Trichloroethane
- MC - Methylene chloride
- AC - Acetone
- TA - Triacetin
- TCE - Trichloroethene

Other
- ClO4 - perchlorate
- D - Dissolved
- ICM - Interim Corrective Measures
- BDL - Below detection limits
- T - Total
- EP - Extraction procedure

ppm - parts per million (liquid)

Table B-2
Summary of Waste Characteristics and Chemical Analyses - Surface Impoundments (SI)
ATK Thiokol Propulsion, Bacchus Works, West Valley City, Utah

SWMU	Material Handled and Waste Types	Remedial ICMs to date and Work Plans Submitted
SI-1 – Discharge from Bldg. 2354	No analytical data-A white substance has been observed on the surface over a portion of unit (suspected to be $NaSbF_6$). Possible contaminants include Hydrofluoric acid, antimony compounds, boron compounds, trisvinyloxypropane (TVOPA) and tetrafluorohydrazine	
SI-2 – Discharge from Bldg. 8104	No analytical data – A white substance has been observed on the surface over a portion of unit (suspected to be $NaSbF_6$). Possible contaminants include Fluoride compounds, methylene chloride, acetone, and polychlorinated Epichlorohydrin (PCDE).	

Table B-3
Summary of Waste Characteristics and Chemical Analyses - Sewage Lagoons (SL)
ATK Thiokol Propulsion, Bacchus Works, West Valley City, Utah

SWMU	Influent	Remedial ICMs to date and Work Plans Submitted
SL-2 – Discharge from Plant 1 sewage treatment system and plant 1 powerhouse	Influent to Plant 1 sewage treatment system Acetone – 630 ppb MEK – 120 ppb TCA – 18 ppb *MC – 1,300,000 ppb Silver - 110 ppb 8/19/88, 3700 gallons boiler blowdown with pH of 1.5 11/21/00, 25,000 gallons boiler blowdown with pH of 11, 8,000 gallons high chloride water softener regeneration	
SL-3 – Received overflow from SL-2	Influent to Plant 1 sewage treatment system Acetone – 630 ppb MEK – 120 ppb TCA – 18 ppb *MC – 1,300,000 ppb Silver - 110 ppb	
SL-4 – Received effluent from NIROP sewage treatment plant	Influent to NIROP sewage treatment system Acetone – 18 ppb TCE – 9.5 ppb Chloroform – 16 ppb 11/17/00, sewer line blockage overflowed 225K gallons domestic sewage, 150K pH <11.5 boiler blowdown, 25K high chloride water softener regen to lagoon	

Legend

ppb parts per billion ppm parts per million
* -Thought to be an anomalous sample point
MEK - Methyl ethyl ketone
TCA - Trichloroethane
MC - Methylene chloride

Table B-4
Summary of Waste Characteristics and Chemical Analyses - Septic Systems (SS)
ATK Thiokol Propulsion, Bacchus Works, West Valley City, Utah

SWMU	Influent	Remedial ICMs to date and Work Plans Submitted
SS-1 – Received discharge From Bldg. 35-A (NDT Photo Lab)	Data includes substantial levels of silver being discharged to SS-1. No sample analyses are available	
SS-2 – Received discharge From Bldgs. 2186 and 2187 (NDT Photo Labs)	SS-2 abandoned before 1980; a sump and ditch were used after that. See Sump No. 9 for data	
SS-3 – Received discharge From Bldg. 2398 (Photo Lab)	No analytical data available. Possible that significant metal contamination exists, including silver, with lesser concentrations of cadmium, chromium, and lead.	
SS-4 – Received discharge From Bldg. 8121	No data available. Reports indicate that explosives and explosive-contaminated materials, solvents, sanitary waste could be present. See Sump No. 21 for data	
SS-5 – Received discharge From Bldg. 8123	No data available, likely that metal contamination exists, (Photo Lab) primarily silver.	
SS-11 – Received discharge From Bldg. 2175 (Photo Lab)	No data available, likely that metal contamination exists, primarily silver.	

Table B-5
Summary of Waste Characteristics and Chemical Analyses - Buried Waste Sites (BW)
ATK Thiokol Propulsion, Bacchus Works, West Valley City, Utah

SWMU	Landfill Type and Size	Buried Waste Type	Soil/Waste Chemical Analyses	Soil Gas	Remedial ICMs to date and Work Plans Submitted
BW-1	Trench disposal with soil cover, no liners. Interim measure excavation and removal of wastes conducted in 1985 and 1986. Residual contaminated soils are likely present, however, the extent has not been determined. Site area is approximately 1.5 acres.	Laboratory chemicals. No record of amounts or types.	Excavated soils and wastes analytical results revealed elevated concentrations of solvents, including TCA, TCE, toluene, xylene, MEK, MIBK, orthodichlorobenzene, and methylene chloride.	DCE – 200 ug/l TCA – 200 ug/l	10/85, BW-1 ICM, Hercules/Dames & Moore/USPCI 10/85, One up-gradient and three down gradient monitoring wells installed 10/86, 2nd Phase of BW-1 ICM Hercules/OHM 4/87, Soil Gas Survey as part of GW Assessment 9/00, Closure Plan for the BW-1 Landfill Area 9/27/02, UDSHW Comments on 9/00 document ATK response to comments , December 2002
BW-2	Trench disposal with soil cover, no liners. Trenches are 10-12 feet deep with 4-5 feet of soil cover. Area of site is defined by Interim Corrective Measure excavation.	Has received hazardous and inert waste. Drums, bagged laboratory waste and debris were removed and disposed in 1990.	1,1,1-Trichloroethane, Methylene Chloride, Acetone, MEK, Epoxy Resins, Tar, PNAs, Acids	No information	1990, ICM, Hercules/ AWD/ Reynolds Bros.
BW-3	The site area is approximately 0.7 acre. The boundaries of the unit are defined approximately by natural and man-made features and by Interim Corrective measure excavation.	Has received hazardous and inert waste. Drums, bagged laboratory waste and debris were removed and disposed in 1990.	1,1,1-Trichloroethane, Methylene Chloride, Acetone, MEK, Epoxy Resins, Tar, PNAs, Acids	No information	1990, ICM, Hercules/ AWD/ Reynolds Bros.
BW-4	Open pit disposal with soil cover, no liners. The number and size of the pits is not known.	Tooling nozzles, motor casings, and scrap parts.	1970's contractor removed a portion of scrap metal, no samples taken.	No information	1970's, scrap metal removed
BW-5	Open pit disposal with soil cover, no liners. The site area is approximately 1.0 acre. The boundaries of the unit are defined approximately by the limit of an old gravel pit.	Tooling nozzles, motor casings, and scrap parts. Phosphoric acid and silver amalgam reported in northwest corner.	1970's contractor removed a portion of scrap metal, no samples taken.	No information	1970's, scrap metal removed

Table B-5 (Cont.)

SWMU	Landfill Type and Size	Buried Waste Type	Soil/Waste Chemical Analyses	Soil Gas	Remedial ICMs to date and Work Plans Submitted
BW-7	Two buried waste sites using the open pit and end-dumping methods, and a waste pile (previously WP-1). The buried waste sites are unlined and apparently covered with soil One of the buried waste sites includes the former BW-8. The BW-7 boundaries, including BW-8, are not well defined.	Contaminated tooling, motor casings, scrap parts, and burning ground ash.	No samples taken	No information	
BW-9	Open pit disposal with soil cover and no liners. The number and size of the pits has not been determined.	Piping, contaminated tooling, motor casing, scrap parts, and reportedly 2-3 truckloads of chemical wastes.	1970's contractor reclaimed some of the tooling, no samples taken.	No information	1970's, scrap metal removed
BW-11	Trench disposal with soil cover, no liners. Trenches are 10-12 feet deep with 4-5 feet of soil cover. One trench was approximately 100 feet long and 10 feet wide, and the other was approximately 45 feet long and 6 feet wide. The unit boundaries have been defined by Interim Corrective Measures excavation.	Has received hazardous and inert waste. Drums, bagged laboratory waste and debris were removed in 1990.	1,1,1-Trichloroethane, methylene Chloride, Acetone, MEK, Epoxy Resins, Tar, PNAs, Acids	No information	1990, ICM, Hercules/ AWD/ Reynolds Bros.
BW-12	The disposal method is not known. The site is approximately 3.5 acres and the boundaries are generally defined by local features.	Garbage from offices, general refuse, and household type waste.	No samples taken	No information	
BW-13	Trench disposal with partial soil cover, no liners. The boundaries of the unit are not well defined.	Fiber and steel drums that formerly held non-explosive material.	No samples taken	No information	9/91, Hercules, ICM as an exploratory trench along road to Pit 38

Table B-6
Summary of Waste Characteristics and Chemical Analyses - Miscellaneous SWMUs
ATK Thiokol Propulsion, Bacchus Works, West Valley City, Utah

SWMU	Waste Types	Remedial ICMs to date and Work Plans Submitted
Salvage Areas, SA		
SA-2	No analytical data available. Materials stored are the solid residues from Burning cage (BP-3) operations, including drum lids, miscellaneous machinery parts, piping, ducting, and scrap lead.	
SA-3	No analytical data available. Site has been used to store tooling, spare machinery, empty tanks, and discarded metal drums. Some drums removed in 1986-1987 contained solvent-contaminated liquids.	1986 to1987, drums containing solvent contaminated liquids removed, Hercules
SA-5	No analytical data available. Site was used to transfer fluorine from rail tank cars to gas cylinders. Piping, gauges, and valves still present.	12/93 to 12/94, Fluorine ICMs approved by UDSHW, corrective action performed by Hercules
Burning Pads, BP		
BP-1 Burned Includes 6 pads, burning cage, and solvents tank filter unit waste	No analytical data available. Wastes included NG, propellant, and materials contaminated with explosives. Organics and metals were also included in the materials.	
BP-2	1920's through 1962. Metals, powderline plate steel burning pan found and slag on it sampled 3/29/02	TCLP of slag in ppb: Al 3100, Sb 1910, Ba 155, Be 2.7, Ca 9.2, Pb 1,590,000, Ni 60, Tl 436, all others non-detect
BP-3 Includes 1 burning cage	No analytical data available. Used to burn trash and waste containers used during transfer of solid propellant ingredients.	
BP-4	Unconfined burn area; a dirt surface where burning tests not expected to lead to a detonation are conducted. Site not identified in RFA or FIR because open burning began in this area after the FIR (1989).	None; still active
Open Detonation Areas, OD		
OD-4	No analytical data available. Wastes managed at OD-4 were undissolved solids from the detonation testing of mini-mines. These mines were made of powdered silica, lead azide, and RDX. The surface soils were removed to a depth of one foot during interim corrective measure actions.	1990, ICM, Hercules/ Reynolds Brothers, USPCI

Table B-6 (Cont.)

SWMU	Waste Types	Remedial ICMs to date and Work Plans Submitted
Burning Ground, BG		
BG-1	Preliminary analysis of data obtained during interim measure action, indicate that VOC and metals occurred in ash. The hazardous material burned included NG, propellant, and explosives from the production of rocket motors. Wastes may also be contaminated with solvents and metals.	1990, Sub Part X Upgrade involved an ICM to remove burning pad soils to a depth of one to two feet for disposal at USPCI Grassy Mountain, Hercules/Reynolds Brothers/ USPCI
Spill Areas, SP		
SP-3	Spill consisted of lubricating oil and water from compressor filters in Bldg. 18, the boiler house.	
SP-4	No data available. Spill consisted of thinners, stoddard solvents, acetone, and degreasers from Bldg. 20.	
SP-5	No data available. Spill consists of residues of lubricating oil, diesel, and gasoline.	
SP-6	Current waste waters from Bldg. 2460: acetone – 43.5 ppm, MC-0.5 ppm, 1,1,1 TCS – 1260 ppm, xylene – 4.74 ppm, lead – 38.4 ppm. The spilled wastewater contained hydroxy terminated polybutadiene (HTPB), freon, and lead octoate.	07/06/91,Clean Closure by removal of concrete vault. No work plan submitted to UDSHW as this was a <90 day storage unit. Sample IS10155: TCLP Metals <detection, RCRA Listed non-purgeable <detection, RCRA VOCs <detection

ppm parts per million
ClO4 perchlorate
NG nitroglycerine
HMX cyclotetramethylene tetranitramine
RDX cyclotrimethylene trinitramine
ICMs Interim Corrective Measures

Table B-7
Summary of Waste Characteristics and Chemical Analyses Identified since the Facility Information Report (FIR, 9/14/88)
ATK Thiokol Propulsion, Bacchus Works, West Valley City, Utah

SWMU	Waste Types	Remedial ICMs to date and Work Plans Submitted
SP-9	03/01/88, NIROP Bldg. 49A, Large Motor Sawing (2163). Est. 6,000 gallons explosive contaminated wastewater leaked from 8,000 gallon tanker spotted at wastewater tank loading station. Wastewater potentially can contain NG, di-NG, NC, HMX, RDX, AP, Al	No record of reporting to agencies. No water samples taken. (Est.) 2500 gallons relayed in Tote-Bins to Sump S-2 for disposal to ground. 700 gallons retained in catch tank house, 300 gallons in floor dry slummed to burning ground, 2500 gallons to ground around loading station.
SP-11	05/09/89, Plant 1 Bldg. 2214, 50 Gallon Mix Solvent shed. Wind blew over shed releasing est. 20 to 25 gallons of Stoddard solvent to ground from drum inside that overturned.	No record of reporting to agencies. No samples taken. After diking, 4 to 5 gallons recovered on rags, 55 gallons of soil drummed.
SP-12	07/16/89, Plant 1 Acid Area Bldg. 9108, Denitrated Sulfuric Acid AST. Release of est. 3000 gallons through hole at center of tank bottom due to corrosion.	Reported to UDSHW. Insitu neutralization materials left in place. Sampling below 4 feet for pH approximately one year later showed neutralization to be complete.
SP-14	02/09/90, Plant 1 Waste Water Treatment Plant, South side of Bldg. 8569. Tanker manifold split by freezing. Est. 500 gallons of 51 ppm TCA contaminated water to ground	UDSHW notified. 25 gallons caught in drum below leaking tanker manifold.
SP-15	09/11/96, 12/04/96, Plant 1 Rocket Assembly #1, Bldg. 2164. Waste water collection tank overflow to ground estimated as 200 gallons of water each time containing 16-18 mg/l acetone. On 12/04 water contained 31.8 mg/l NG, 1.31 mg/l HMX, 0.68 mg/l di-NG, <0.1 RDX, Total Metals all <detection.	Water retained in tank manway was sampled for VOCs after both events and for Total Metals after 12/04 event. Observed channel erosion caused by recent overflow at manway lid/vent pipe. Had level indication instrumentation repaired each time.
SP-16	06/14/97, Plant 1 Neutralization vaults, Bldg. 8560. ≤ pH 11.5 boiler blowdown to ground from overflow of concrete box south of large vaults due to failure of electrical controller to open valve.	>2 pH to <12.5 pH considered non-reportable

Table B-7 (Cont.)

SWMU	Waste Types	Remedial ICMs to date and Work Plans Submitted
SP-18	05/21/01, Plant 1, NG Area, Mixed Acid Storage Tank Bldgs. 9109 and 9110 removal. Hose failed releasing < an estimated 30 gallons of very low pH mixed acid onto a visqueen liner that leaked to soils inside an earthen containment	Removal of the tanks was being performed under a UDSHW emergency permit. Field sampling on 06/11/01 had scattered hits of pH 1 to 4 near the ground surface with neutral pH 6" below grade.
SP-19	01/03/02, Plant 1, Machining Bldg. 2114. Fire system upset in operating building released <30 gallons of chip collection water out the door to ground. Water contained up to: 53.2 ppm ClO4, 8.8 ppb NG and 8.86 ppb HMX.	Three remediation efforts in snow and frozen ground reduced ClO4 and Explosives to non-detect at the hand dug cross-trench where the contaminated water was collected and soaked in.
SP-20	01/26/02, Plant 1, Machining Bldgs., 2114, 2115, 2116 Waste Water Collection Tank (WWT). Freeze-Thaw failure of a culinary water valve in Bldg. 2116 released <30 gallons of water to ground from the WWT. Clear water from the tank vent had 6.3 ppm ClO4. Green water from the tank loading station had 240 ppm ClO4, 48.3 ppm NG and 5.5 ppm HMX.	Three remediation efforts reduced contamination below the vent pipe to non-detect (≤ 560 ppb) and below the loading station to 0.1 ppm ClO4 and 0.881 ppm HMX.
SP-21	1965? Through 1969 Freon 113 Railcar Tanker Offloading Facility by Bldg. 9310 (Box Factory)	ICM Soil Gas Survey approved by UDSHW 11/14/97, confirmation letter dated 2/4/99.
SP-22	1965? Through 1969, Freon 113 Storage Tank Farm	ICM Soil Gas Survey approved by UDSHW 11/14/97, confirmation letter dated 2/4/99.
SP-23	Pre-1908? Exposed remnants of >24" diameter riveted iron aqueduct on yellow stained gravels devoid of plant life located due east of Plant 1 Bldg. 9318	None

Table B-8
SUMMARY OF WASTE CHARACTERISTICS AND CHEMICAL ANALYSES - GROUNDWATER MANAGEMENT UNIT
ATK Thiokol Propulsion, Bacchus Works, West Valley City, Utah

Unit	Waste Types	Status of Corrective Action
Groundwater Management Unit (GWMU)	Volatile Organic Compounds Explosives Perchlorate Metals	Groundwater Flow and Contaminant Transport Model Report submitted to UDSHW: 6/29/01